

Figure 1.0 A Personal Computer Running an Example Electronic Spreadsheet Window

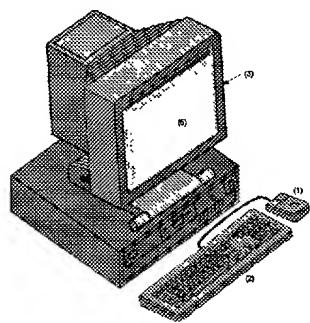


Figure 2.0 Typical Electronic Spreadsheet Windows without Data

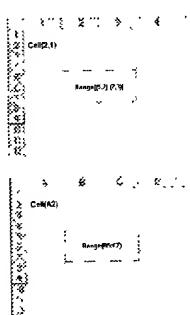


Figure 3.9 A Data Spreadsheet with Key ID in the Original Data File

Figure 3.1 A Data Spreadsheet Retrieved in Obvious Key ID

Key ID	Value
1	1
2	2
3	3
4	4
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Figure 3.2 A Data Spreadsheet cell Using an Inserted Key-ID to Form Separate Data Sets

	A	B	C	D	E
Y <sub>1</sub> = 100	100	100	100	100	100
Y <sub>2</sub> = 200	200	200	200	200	200
Y <sub>3</sub> = 300	300	300	300	300	300
Y <sub>4</sub> = 400	400	400	400	400	400
Y <sub>5</sub> = 500	500	500	500	500	500
Y <sub>6</sub> = 600	600	600	600	600	600
Y <sub>7</sub> = 700	700	700	700	700	700
Y <sub>8</sub> = 800	800	800	800	800	800
Y <sub>9</sub> = 900	900	900	900	900	900
Y <sub>10</sub> = 1000	1000	1000	1000	1000	1000
Y <sub>11</sub> = 1100	1100	1100	1100	1100	1100
Y <sub>12</sub> = 1200	1200	1200	1200	1200	1200
Y <sub>13</sub> = 1300	1300	1300	1300	1300	1300
Y <sub>14</sub> = 1400	1400	1400	1400	1400	1400
Y <sub>15</sub> = 1500	1500	1500	1500	1500	1500
Y <sub>16</sub> = 1600	1600	1600	1600	1600	1600
Y <sub>17</sub> = 1700	1700	1700	1700	1700	1700
Y <sub>18</sub> = 1800	1800	1800	1800	1800	1800
Y <sub>19</sub> = 1900	1900	1900	1900	1900	1900
Y <sub>20</sub> = 2000	2000	2000	2000	2000	2000
Y <sub>21</sub> = 2100	2100	2100	2100	2100	2100
Y <sub>22</sub> = 2200	2200	2200	2200	2200	2200
Y <sub>23</sub> = 2300	2300	2300	2300	2300	2300
Y <sub>24</sub> = 2400	2400	2400	2400	2400	2400
Y <sub>25</sub> = 2500	2500	2500	2500	2500	2500
Y <sub>26</sub> = 2600	2600	2600	2600	2600	2600
Y <sub>27</sub> = 2700	2700	2700	2700	2700	2700
Y <sub>28</sub> = 2800	2800	2800	2800	2800	2800
Y <sub>29</sub> = 2900	2900	2900	2900	2900	2900
Y <sub>30</sub> = 3000	3000	3000	3000	3000	3000
Y <sub>31</sub> = 3100	3100	3100	3100	3100	3100
Y <sub>32</sub> = 3200	3200	3200	3200	3200	3200
Y <sub>33</sub> = 3300	3300	3300	3300	3300	3300
Y <sub>34</sub> = 3400	3400	3400	3400	3400	3400
Y <sub>35</sub> = 3500	3500	3500	3500	3500	3500
Y <sub>36</sub> = 3600	3600	3600	3600	3600	3600
Y <sub>37</sub> = 3700	3700	3700	3700	3700	3700
Y <sub>38</sub> = 3800	3800	3800	3800	3800	3800
Y <sub>39</sub> = 3900	3900	3900	3900	3900	3900
Y <sub>40</sub> = 4000	4000	4000	4000	4000	4000
Y <sub>41</sub> = 4100	4100	4100	4100	4100	4100
Y <sub>42</sub> = 4200	4200	4200	4200	4200	4200
Y <sub>43</sub> = 4300	4300	4300	4300	4300	4300
Y <sub>44</sub> = 4400	4400	4400	4400	4400	4400
Y <sub>45</sub> = 4500	4500	4500	4500	4500	4500
Y <sub>46</sub> = 4600	4600	4600	4600	4600	4600
Y <sub>47</sub> = 4700	4700	4700	4700	4700	4700
Y <sub>48</sub> = 4800	4800	4800	4800	4800	4800
Y <sub>49</sub> = 4900	4900	4900	4900	4900	4900
Y <sub>50</sub> = 5000	5000	5000	5000	5000	5000
Y <sub>51</sub> = 5100	5100	5100	5100	5100	5100
Y <sub>52</sub> = 5200	5200	5200	5200	5200	5200
Y <sub>53</sub> = 5300	5300	5300	5300	5300	5300
Y <sub>54</sub> = 5400	5400	5400	5400	5400	5400
Y <sub>55</sub> = 5500	5500	5500	5500	5500	5500
Y <sub>56</sub> = 5600	5600	5600	5600	5600	5600
Y <sub>57</sub> = 5700	5700	5700	5700	5700	5700
Y <sub>58</sub> = 5800	5800	5800	5800	5800	5800
Y <sub>59</sub> = 5900	5900	5900	5900	5900	5900
Y <sub>60</sub> = 6000	6000	6000	6000	6000	6000
Y <sub>61</sub> = 6100	6100	6100	6100	6100	6100
Y <sub>62</sub> = 6200	6200	6200	6200	6200	6200
Y <sub>63</sub> = 6300	6300	6300	6300	6300	6300
Y <sub>64</sub> = 6400	6400	6400	6400	6400	6400
Y <sub>65</sub> = 6500	6500	6500	6500	6500	6500
Y <sub>66</sub> = 6600	6600	6600	6600	6600	6600
Y <sub>67</sub> = 6700	6700	6700	6700	6700	6700
Y <sub>68</sub> = 6800	6800	6800	6800	6800	6800
Y <sub>69</sub> = 6900	6900	6900	6900	6900	6900
Y <sub>70</sub> = 7000	7000	7000	7000	7000	7000
Y <sub>71</sub> = 7100	7100	7100	7100	7100	7100
Y <sub>72</sub> = 7200	7200	7200	7200	7200	7200
Y <sub>73</sub> = 7300	7300	7300	7300	7300	7300
Y <sub>74</sub> = 7400	7400	7400	7400	7400	7400
Y <sub>75</sub> = 7500	7500	7500	7500	7500	7500
Y <sub>76</sub> = 7600	7600	7600	7600	7600	7600
Y <sub>77</sub> = 7700	7700	7700	7700	7700	7700
Y <sub>78</sub> = 7800	7800	7800	7800	7800	7800
Y <sub>79</sub> = 7900	7900	7900	7900	7900	7900
Y <sub>80</sub> = 8000	8000	8000	8000	8000	8000
Y <sub>81</sub> = 8100	8100	8100	8100	8100	8100
Y <sub>82</sub> = 8200	8200	8200	8200	8200	8200
Y <sub>83</sub> = 8300	8300	8300	8300	8300	8300
Y <sub>84</sub> = 8400	8400	8400	8400	8400	8400
Y <sub>85</sub> = 8500	8500	8500	8500	8500	8500
Y <sub>86</sub> = 8600	8600	8600	8600	8600	8600
Y <sub>87</sub> = 8700	8700	8700	8700	8700	8700
Y <sub>88</sub> = 8800	8800	8800	8800	8800	8800
Y <sub>89</sub> = 8900	8900	8900	8900	8900	8900
Y <sub>90</sub> = 9000	9000	9000	9000	9000	9000
Y <sub>91</sub> = 9100	9100	9100	9100	9100	9100
Y <sub>92</sub> = 9200	9200	9200	9200	9200	9200
Y <sub>93</sub> = 9300	9300	9300	9300	9300	9300
Y <sub>94</sub> = 9400	9400	9400	9400	9400	9400
Y <sub>95</sub> = 9500	9500	9500	9500	9500	9500
Y <sub>96</sub> = 9600	9600	9600	9600	9600	9600
Y <sub>97</sub> = 9700	9700	9700	9700	9700	9700
Y <sub>98</sub> = 9800	9800	9800	9800	9800	9800
Y <sub>99</sub> = 9900	9900	9900	9900	9900	9900
Y <sub>100</sub> = 10000	10000	10000	10000	10000	10000

Figure 3.3 Flow Chart of Macro Program for Inserting Key-ID

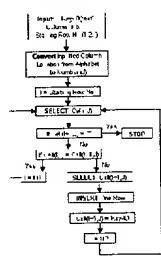
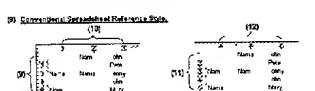


Figure 4.0 Cell Collection Expression vs. Conventional Spreadsheet Reference Style  
for Cell Identification



(b) Cell Collection Expression (CCE) vs. Conventional Cell Reference for Cell Identification

Cell Collection Parameters: CellKey (B1) = A1

Conventional Cell Reference: CellRef(R1C1, R2C2) = (LeftCell, LeftRow, RightCell, RightRow)

Example	Cell Collection Expression	Conventional Cell Reference	Cell Located
1	CellName E	= C5:D5 (1, 5:5)	None
		= C5:D5 (1, 5:5)	None
2	CellName A	= C5:D5 (1, 1:5)	None
		= C5:D5 (1, 1:5)	None
3	CellName B	= P5:Q5 (5, 2:2)	None
		= P5:Q5 (5, 2:2)	None
4	CellName C	= C5:D5 (1, 1:1)	None
		= C5:D5 (1, 1:1)	None
5	CellName D	= C5:D5 (1, 1:1)	None
		= C5:D5 (1, 1:1)	None

Figure 5.0 Cell Collection Expression Used to Represent or Identify the Cells containing the Key ID

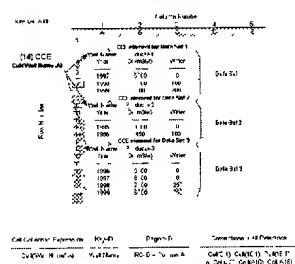


Figure 5.1 Standard Coordinate System Assignment to a COE element (Set Data 549)

Standard Coordinate System assigned to a COE element with point of origin (0,0) in Data Set 1

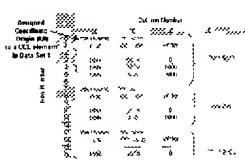


Figure 5.2 Standard Coordinate System Assignment to a CCE element (2nd Data Set)

Standard Coordinate System assigned to a CCL intersect with point at origin 0,0,0 in Data Set 2

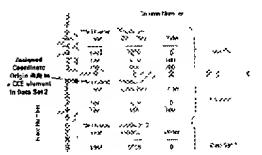


Figure 6.0- Example- Performing a 'Copy Paste' Operation on a Spreadsheet

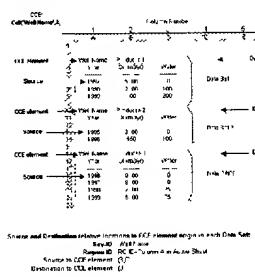


Figure 5.1 Results of a 'Copy Paste' Operation

	A	B	C	D	E
W1	W1	W1	W1	W1	W1
W2	W2	W2	W2	W2	W2
W3	W3	W3	W3	W3	W3
W4	W4	W4	W4	W4	W4
W5	W5	W5	W5	W5	W5
W6	W6	W6	W6	W6	W6
W7	W7	W7	W7	W7	W7
W8	W8	W8	W8	W8	W8
W9	W9	W9	W9	W9	W9
W10	W10	W10	W10	W10	W10
W11	W11	W11	W11	W11	W11
W12	W12	W12	W12	W12	W12
W13	W13	W13	W13	W13	W13
W14	W14	W14	W14	W14	W14
W15	W15	W15	W15	W15	W15
W16	W16	W16	W16	W16	W16
W17	W17	W17	W17	W17	W17
W18	W18	W18	W18	W18	W18
W19	W19	W19	W19	W19	W19
W20	W20	W20	W20	W20	W20
W21	W21	W21	W21	W21	W21
W22	W22	W22	W22	W22	W22
W23	W23	W23	W23	W23	W23
W24	W24	W24	W24	W24	W24
W25	W25	W25	W25	W25	W25
W26	W26	W26	W26	W26	W26
W27	W27	W27	W27	W27	W27
W28	W28	W28	W28	W28	W28
W29	W29	W29	W29	W29	W29
W30	W30	W30	W30	W30	W30
W31	W31	W31	W31	W31	W31
W32	W32	W32	W32	W32	W32
W33	W33	W33	W33	W33	W33
W34	W34	W34	W34	W34	W34
W35	W35	W35	W35	W35	W35
W36	W36	W36	W36	W36	W36
W37	W37	W37	W37	W37	W37
W38	W38	W38	W38	W38	W38
W39	W39	W39	W39	W39	W39
W40	W40	W40	W40	W40	W40
W41	W41	W41	W41	W41	W41
W42	W42	W42	W42	W42	W42
W43	W43	W43	W43	W43	W43
W44	W44	W44	W44	W44	W44
W45	W45	W45	W45	W45	W45
W46	W46	W46	W46	W46	W46
W47	W47	W47	W47	W47	W47
W48	W48	W48	W48	W48	W48
W49	W49	W49	W49	W49	W49
W50	W50	W50	W50	W50	W50
W51	W51	W51	W51	W51	W51
W52	W52	W52	W52	W52	W52
W53	W53	W53	W53	W53	W53
W54	W54	W54	W54	W54	W54
W55	W55	W55	W55	W55	W55
W56	W56	W56	W56	W56	W56
W57	W57	W57	W57	W57	W57
W58	W58	W58	W58	W58	W58
W59	W59	W59	W59	W59	W59
W60	W60	W60	W60	W60	W60
W61	W61	W61	W61	W61	W61
W62	W62	W62	W62	W62	W62
W63	W63	W63	W63	W63	W63
W64	W64	W64	W64	W64	W64
W65	W65	W65	W65	W65	W65
W66	W66	W66	W66	W66	W66
W67	W67	W67	W67	W67	W67
W68	W68	W68	W68	W68	W68
W69	W69	W69	W69	W69	W69
W70	W70	W70	W70	W70	W70
W71	W71	W71	W71	W71	W71
W72	W72	W72	W72	W72	W72
W73	W73	W73	W73	W73	W73
W74	W74	W74	W74	W74	W74
W75	W75	W75	W75	W75	W75
W76	W76	W76	W76	W76	W76
W77	W77	W77	W77	W77	W77
W78	W78	W78	W78	W78	W78
W79	W79	W79	W79	W79	W79
W80	W80	W80	W80	W80	W80
W81	W81	W81	W81	W81	W81
W82	W82	W82	W82	W82	W82
W83	W83	W83	W83	W83	W83
W84	W84	W84	W84	W84	W84
W85	W85	W85	W85	W85	W85
W86	W86	W86	W86	W86	W86
W87	W87	W87	W87	W87	W87
W88	W88	W88	W88	W88	W88
W89	W89	W89	W89	W89	W89
W90	W90	W90	W90	W90	W90
W91	W91	W91	W91	W91	W91
W92	W92	W92	W92	W92	W92
W93	W93	W93	W93	W93	W93
W94	W94	W94	W94	W94	W94
W95	W95	W95	W95	W95	W95
W96	W96	W96	W96	W96	W96
W97	W97	W97	W97	W97	W97
W98	W98	W98	W98	W98	W98
W99	W99	W99	W99	W99	W99
W100	W100	W100	W100	W100	W100

Figure 6.2. Generalized "Copy Paste" Operation Flow Chart for a Search Region in a User Specified Column

